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## TABLE OF CONTENTS

### MEDICAL DIGESTS

Porphyria - Review of Classification .....	3
Horner's Syndrome - Its Diagnostic Significance .....	7
Bedside Tracheostomy .....	8
Cardiac Massage in Children ....	11
Pediatric Radiology .....	13

### MISCELLANY

Nuclear Medicine Training and Service Opportunity .....	16
American Board Certifications ...	16
Naval Medical Research Reports .	17
Poison Antidote Lockers BuMedInst 6710.48 .....	19

### FROM THE NOTE BOOK

Change in Course Requirement .....	20
Malaria in Personnel from Endemic Areas .....	20
Biomedical Engineering Meetings	20
Biblio-Directory of Cancer Virus Research Workers .....	20
American Board of Obstetrics and Gynecology .....	21
"Lost" Ocean Current Found ....	21

### DENTAL SECTION

Nutrition, Health, Longevity ...	22
Third Molar Agensis and Missing Teeth of Other Types.	23
Hazards - Third Molars .....	23
Personnel and Professional Notes .....	24

### OCCUPATIONAL MEDICINE

Navy CS Industrial Hygienists Certified by American Board .	26
Work Limitations of the Pregnant Employee .....	27
Home Study Courses - Radiation Control and Industrial Hygiene	30
Safe Use of Epoxy Aircraft Finishers .....	31
Hazards of Handling Chemicals While Wearing Contact Lenses	31
Effect of Heat in the Kuwait Operation .....	32
Lifting and Carrying .....	34

### RESERVE SECTION

The Berry Plan (Part III) Armed Forces Physicians Appointment and Residency Consideration Program .....	38
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Please forward changes of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.



Porphyria: The Classification Reviewed

Derek J. Cripps, MB, BS, MS, Univ Mich Med Bull  
28:252-256, July - August 1962

"The porphyrins are pigments which form many vital components of enzyme systems in the plant and animal worlds. Actinoporphyrin and protoporphyrin, for example, are the basic pigments of chlorophyll and hemoglobin, respectively. In man, acquired or inborn enzymatic derangement in porphyrin synthesis causes a group of disorders known as the porphyrias. It is the purpose of this paper to discuss historically the classification of porphyria up to the present time. Each clinical entity is summarized, but the excellent reviews by Kark (1), Eales (2), and the Ciba Foundation (3) may be helpful to the reader.

The earlier classifications of porphyria, such as those of Günther (4) in 1922, Micheli and Dominici (5) in 1931, and Waldenström (6) in 1937, were essentially clinical. Waldenström (6) classified porphyria as congenital, porphyria acuta (with clinical subdivisions), and porphyria cutanea tarda. Watson (7) in 1954 subdivided porphyria into two main groups, based upon whether the porphyrin defect was primarily in the liver or bone marrow: (8)

1. Porphyria Erythropoietica (the congenital type of Waldenström)
2. Porphyria hepatica
  - a. Acute intermittent
  - b. Porphyria cutanea tarda
  - c. Mixed type
  - d. Latent type

The characteristics of Watson's clinical types are as follows:

Porphyria erythropoietica was so named because the defect was said to be in the developing normoblasts of the bone marrow. Schmid (9) demonstrated uroporphyrin I in the erythroblasts of the bone marrow. He also emphasized the rarity of this disease, accepting only 34 cases as genuine examples. This disorder is thought to be recessive but has not yet been observed in subsequent generations. It has been suggested (10) that the defect is due to lack of the enzyme isomerase in the developing normoblasts (Figure 1). This block results in an increase of coproporphyrin I and uroporphyrin I (the light-sensitizing isomer).

The onset of this congenital disease is in infancy, usually presenting with photosensitivity, melanosis, hypertrichosis, and vesiculation on light exposed areas. Vesiculobullous lesions may cause mutilating scars. A frequent feature is erythrodontia and red bones from deposition of uroporphyrin I which fluoresces red. Hemolytic anemia and splenomegaly often occur. Urine examination reveals an excess of uroporphyrin I and coproporphyrin I\* but no porphobilinogen.

\* The isomers are not easily separated and are usually expressed as a total. Normal urine values: uroporphyrin I + III = 0 to 40 µg./day (70 percent of total is type I), and coproporphyrin I + III = 80 to 280 µg./day (70 percent of total is type I).

(From the Department of Dermatology, The University of Michigan, Ann Arbor)

Acute intermittent porphyria occurs more frequently in females. The disease usually begins in young adults and presents with any of the following symptoms: abdominal colic which may be hepatobiliary, renal, or intestinal; hypertension; constipation; neurologic disturbances; or psychoses. During an

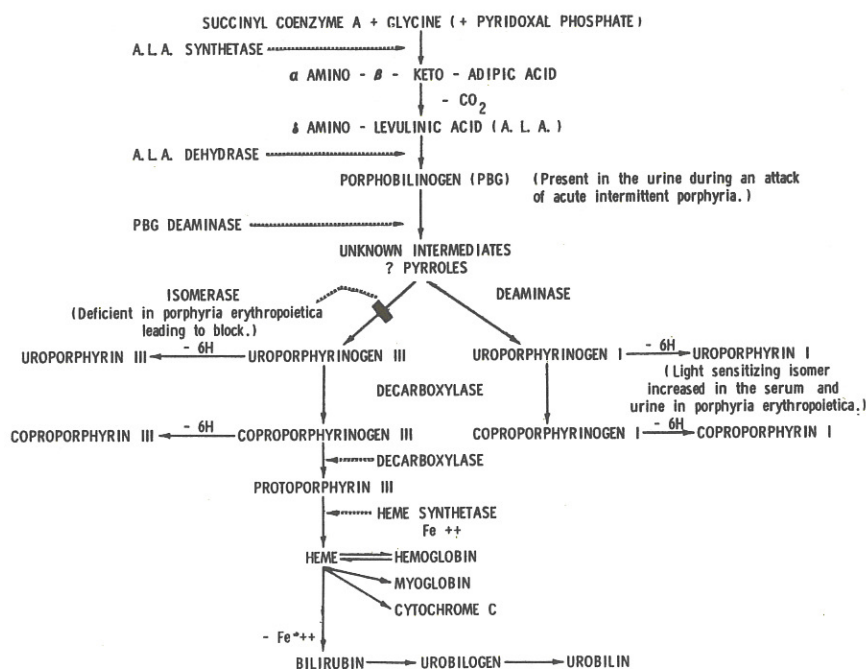


Fig. 1.—Diagram showing possible porphyrin biosynthesis in man.

attack, examination of urine reveals increased porphobilinogen excretion. During periods of remission, porphobilinogen is absent or decreased. The presence of porphobilinogen in the urine can be demonstrated by the Watson-Schwartz test.

Porphyria cutanea tarda is one of the largest group of the porphyrias. It occurs more frequently in man between the ages of 40 and 60 years. There is often a history of excessive alcohol consumption. The presenting features are usually photosensitivity with vesiculation, melanosis, and hypertrichosis occurring on the light-exposed areas. The vesiculobullous lesions, simulating epidermolysis bullosa, are produced by trauma as well as light. The term *bullous actinica et mechanica*, has been used to describe these lesions. Urine examination for porphyrins may reveal any of the four isomers (coproporphyrin I, III, and uroporphyrin I, III) but an excess of uroporphyrins, mostly type III, is often present. Stool examination may show an increase of coproporphyrins and protoporphyrin III. (Normal value of coproporphyrin I plus III is less than 15 µg/gm dry weight and of protoporphyrin III is less than 45 µg/gm dry weight.)

Mixed type occurs more commonly in young adults who have features of acute intermittent porphyria but who will also develop the cutaneous manifestations of porphyria cutanea tarda. During acute intermittent attacks, porphobilinogen is found in the urine. The urinary coproporphyrins and particularly the uroporphyrins are increased during exacerbations of light sensitivity.



Watson (11) reported patients in whom the cutaneous manifestations occurred before or after acute intermittent attacks.

Rimington (12) observed a reciprocal relationship between fecal and urinary porphyrins during exacerbation and remission of porphyria cutanea tarda which he considered characteristic, although this has been disputed by Watson (8, 11, 13). During remission, increased fecal coproporphyrins and protoporphyrin III were observed; but during an attack or exacerbation of the disease these fecal porphyrins were decreased, and the urinary porphyrins (mainly uroporphyrin) were increased. Rimington (14) has also demonstrated that some cases of porphyria cutanea tarda can be confirmed by increased fecal porphyrins even when the urinary porphyrins are normal.

Waldenström (15) was unable to accept Watson's mixed group because he had not seen cases of this type, although he had personally observed 325 patients with acute intermittent porphyria, and neither they nor their families had any cutaneous manifestations. In 1957, Waldenström (15), partly influenced by the importance of fecal porphyrins observed by Rimington (12), reclassified his porphyria cutanea tarda into the following two types:

Porphyria cutanea tarda symptomatica was so named because this type usually occurs in men 50 to 60 years of age with a history of alcoholism and associated cirrhosis of the liver. Cutaneous manifestations occur, but attacks of acute intermittent porphyria do not. Prior to the onset of the disease there is no increased excretion of fecal coproporphyrins and protoporphyrin.

Porphyria cutanea tarda hereditaria (protocoproporphyrin) is described as a hereditary disorder in which, initially, fecal protoporphyrins and coproporphyrins are increased but the patient is asymptomatic (latent stage). In some, but not all, young adults, light sensitivity manifestations occur, at which time porphyrins, particularly uroporphyrins, are increased in the urine. If the liver is damaged, porphobilinogen appears in the urine, and only then do manifestations of acute intermittent porphyria occur. This classification appears to be limited, as it does not include other types of mixed porphyria that have been described (7, 11, 16, 17).

An apparently different form of porphyria has been observed in South Africa by Dean and Barnes (16). They traced 564 cases of porphyria in 54 family groups to a Dutchman who had married in the Cape in 1688. The symptomatology in these cases was that of the mixed type, with acute intermittent attacks occurring more frequently in women and cutaneous lesions more frequently in men. Manifestations of both groups of symptoms sometimes occurred in the same person. Members of the same family who had no symptoms were found to have increased fecal protoporphyrins and coproporphyrins. This form of porphyria could not readily be included under the available classifications, so Dean and Barnes (17) coined the term "porphyria variegata."

The importance of obtaining fecal porphyrins in porphyria patients and their relatives is well demonstrated.

Since 1956, outbreaks of cutaneous porphyria have occurred in three southeastern provinces of Turkey, involving nearly 5000 persons, mostly children and adolescents (18, 19). It was noted that the disease occurred in three

genetically distinct population groups—domestic Turks, Kurds, and Turks who had been repatriated after several centuries in the Balkans. Schmid (18) later demonstrated that the cause of the porphyria was the ingestion of a fungicide, hexachlorbenzene, which had been added to wheat seedlings. Schmid (18) and Watson (11) have suggested that this outbreak of porphyria was acquired and not dependent on a genetic predisposition to porphyria, particularly since the disease occurred in a genetically heterogeneous group.

TABLE I.—*Classification of Porphyria*

WATSON (1960)	WALDENSTRÖM (1957)
I. Porphyria erythropoietica (recessive)	Congenital porphyria
II. Porphyria hepatica	
A. Hereditary acute intermittent (dominant)	Acute intermittent porphyria
1. Manifest—symptomatic	
2. Latent—asymptomatic	
B. Hereditary, mixed, or variegate group (dominant)	Porphyria cutanea tarda hereditaria (protocoproporphyria)
1. Cutaneous with little or no acute manifestations	
2. Acute intermittent without cutaneous symptoms	
3. Various combinations	
4. Latent—asymptomatic	
C. Hereditary cutaneous manifestations	
D. Constitutional or idiosyncratic (porphyria cutanea tarda)	Porphyria cutanea tarda symptomatica
1. Chemicals, especially alcohol	
2. Idiopathic	
3. With systemic disease	
E. Acquired	
1. Secondary to hepatoma	
2. Secondary to fungicide, hexachlorbenzene	

Watson (11) in 1960 published a new classification which included an acquired group and also the porphyria variegata of Dean and Barnes. This is summarized in Table I which also presents Waldenström's classification for comparison. Watson classifies porphyria according to the probable site of porphyrin defect, whereas Waldenström does not agree that one of the defects is necessarily hepatic. Waldenström's porphyria cutanea tarda hereditaria is an entity which does not include all the other types of mixed porphyria that have been described (7, 11, 16, 17).

In conclusion, the author prefers Watson's classification, but admits that the classification of porphyria will remain in dispute until the precise biochemical defect and the site of this defect have been identified."

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\* \* \* \* \*

### Horners Syndrome - Its Diagnostic Significance

O. Solnitzky MD. Georgetown Med Bull 14:204-224, February 1961.

Horner's syndrome is generally considered to consist of the triad: miosis, ptosis, and enophthalmos. But a study of recorded cases has shown that lesions of the cervical sympathetic will be characterized clinically, in different patients, by a combination of eight other features besides the triad. These features will be classified into four functional groups: (a) motor (e.g., miosis, ptosis, and enophthalmos); (b) vasomotor (e.g., vasodilation, flushing, increased skin temperature); (c) trophic (e.g., heterochromia iridis, cataract formation, and hemiatrophy of the face); and (d) secretory (e.g., disturbances of lacrimal secretion and anhidrosis). The more extensive the lesion involving the sympathetic nervous system to the head and neck, the greater will be the constellation of the clinical features presented by the patient.

(1) Horner's syndrome is often caused by lesions having a serious prognosis, such as malignant tumors, trauma, and vascular lesions. (2) It is also related to many chronic degenerative diseases, such as amyotrophic lateral sclerosis. (3) A complete Horner's syndrome is obtained when the lesion involves the cervico-thoracic function of the spinal cord or the anterior roots and the associated communicating rami. (4) Central lesions usually produce a dissociated Horner's syndrome consisting often only of miosis. (5) In peripheral lesions, certain functional sympathetic fibres (motor, trophic, vasomotor, or secretory) may escape injury, accounting for the frequent variability of the syndrome. (6) The syndrome is always unilateral to the lesion whether it is



central or peripheral. (7) Bilateral syndrome occurs with central lesions involving the midline. (8) This latter type of Horner's syndrome is often preceded by its converse, the syndrome of irritation of the cervical sympathetic. (9) Some of the motor fibres of the cervical sympathetic follow the external carotid artery so that a Horner's syndrome caused by lesions affecting the peripheral sympathetic above the bifurcation of the common carotid artery is not associated with anhidrosis. Finally, (10) the primary, secondary, and tertiary neurons of the cervical sympathetic have rich relations with the regions through which they pass. Hence, Horner's syndrome together with the regional signs and symptoms is of great value in diagnosing the level of the lesion.

(From the Pakistan Medical Journal XIII:61, August 1962)

NOTE: When Doctor Dean Lewis was Professor of Surgery at the Johns Hopkins University School of Medicine and Johns Hopkins Hospital, he queried his students a number of times each year about the "cilio-spinal center of Budge." In particular, he emphasized its importance as a diagnostic aid in traumatic or other lesions of the cervical portion of the spinal cord. He taught that damage to this so-called "genital center" may be reflected by a triad of (1) Horner's syndrome, (2) Hyperpyrexia, and (3) Priapism, often denoting a situation of grave import.

Some authorities list automobile accidents, diving mishaps (usually in shallow and unfamiliar water), and falling down steps as the three leading causes, in that order, of injury to the cervical spinal cord.

—Editor

\* \* \* \* \*

### Bedside Tracheostomy\*

Benson B. Roe MD, F.A.C.S., San Francisco, Calif. Surg Gynec Obstet  
115:239-241, August 1962.

All physicians are aware of the lifesaving value of an emergency tracheostomy for acute laryngeal obstructions, and most surgeons are familiar with the classic indications for elective tracheostomy to facilitate maintenance of an adequate airway. Patients in borderline respiratory distress, however, often are deprived of this valuable procedure, with subsequent serious or fatal consequences. Experience gained from managing respiratory complications after open heart surgery and the dramatic results obtained from tracheostomy have led to a more liberal policy of performing this procedure with minimal indications.

Although tracheostomy is a simple surgical operation, the procedure is often deferred or postponed because of time, nuisance, and expense involved in moving the patient to the operating theater. To overcome such potentially dangerous reluctance to perform tracheostomies, the procedure on the writer's service has been simplified to a bedside technic which can be performed rapidly and easily, even by junior residents.



Once the need for an improved airway is apparent, the procedure is performed in the ward in the same informal manner in which a thoracentesis or a venous cutdown would be done. In more than 40 patients the author's experience with this method has failed to substantiate the traditional fear of technical difficulty under less than ideal circumstances.

In most instances, patients who need a tracheostomy should not be subjected to the potential hazard of even brief postponement. Frequently, circumstances causing marginal airway obstruction will progress rapidly into an acute respiratory embarrassment. Often, the emotional stress or physical activity associated with being transported to the operating theater will precipitate such a crisis. For this reason, the author considers every postoperative tracheostomy as an emergency to be performed without unnecessary delay. In most hospitals, the interval between decision and incision for this type of emergency is rarely less than 15 minutes and could be more than an hour; whereas, in the ward where instrument trays are readily available, tracheostomy can be started in from 1 to 3 minutes.

Postoperative patients with borderline respiratory reserve must be treated vigorously so that adequate ventilation and a clear airway can be maintained at all times. This objective is not easily accomplished in many patients, and must not be neglected because of this difficulty. Patients should be taught proper breathing and coughing preoperatively, and should be provided with all the usual ventilatory aids postoperatively, including nebulized moisture, intermittent positive pressure breathing, nasotracheal aspiration, and expectorants. If these measures are ineffective or if gross atelectasis is manifest, bedside bronchoscopy should be carried out immediately. In a significant number of patients, however, these measures are either difficult or only temporarily successful.

Elective tracheostomy at the bedside is, therefore, recommended under the following circumstances: (1) when laryngeal stridor is sufficient to delay either the inspiratory or expiratory phase of respiration, and if it seems to be progressing; (2) when ineffective coughing results from retained secretions which cannot be kept evacuated by nasotracheal suction; (3) when repeated episodes of atelectasis occur—manifested by episodes of simultaneous rise in temperature, pulse, and respiration—in spite of vigorous measures to maintain a clear airway; (4) when nasotracheal or bronchoscopic aspiration is difficult, time-consuming, or exceedingly traumatic; and (5) when prolonged and assisted positive pressure respiration is necessary to prevent hypoxia—for example, in pulmonary hypertension, respiratory paralysis, tetanus, or coma. A balloon-cuffed tracheostomy tube is used.

### Technic

To facilitate a tracheostomy, a small kit is maintained which is designed to avoid the clutter of unnecessary equipment and difficulty in finding the essential instruments. This kit contains (1) local anesthetic with syringe and needle; (2) scalpel with a pointed blade; (3) small curved clamps; (4) an L-shaped hook

for tracheal traction; and (5) two small vein retractors. Additional instruments, if necessary, can be obtained from an emergency tray which also should be kept available.

Tracheostomy tubes should be of the short variety with a 60-degree curve to prevent riding on the carina, especially in children, and erosion of the anterior tracheal wall (Figure 1).

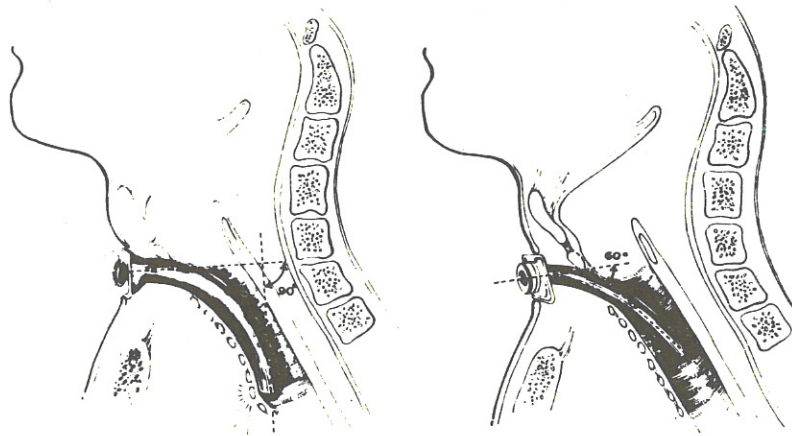


FIG. 1. Tracheostomy tube with a 90 degree curve erodes against the anterior tracheal wall. The tube with a 60 degree angle lies in a more satisfactory position. Note the angulation of the tracheal axis away from the anterior neckline.

The procedure consists of preparing the neck and draping it with only two towels. The wound, of necessity, becomes grossly contaminated so that elaborate aseptic technic seems illogical. Anatomic orientation is facilitated by leaving the skin and upper part of the neck undraped. A small tract is preferred to avoid extensive tissue contamination, to reduce the hazard of hemorrhage, and to implement tamponading any superficial bleeding.

The skin is infiltrated with a local anesthetic agent and a 1.5 to 2 centimeter transverse incision is made just below the larynx. Vertical incision has been recommended by some and may be desirable in acute emergencies. However, a horizontal incision provides good exposure and a more satisfactory scar results. The bleeding from a transverse incision is rarely a problem if blunt dissection is used beneath the skin layer. Should local hemorrhage be encountered, it can be easily controlled if finger pressure is applied to the small incision while the patient is being transferred to the operating room. Failure to complete the tracheostomy at the bedside has occurred only once in the author's experience, and the patient suffered no blood loss or untoward effects from being moved.

Dissection should be carried only through the anterior cervical fascia in an orifice wide enough to permit introduction of the index finger. Complete surgical exposure of the tracheal cartilage is not necessary, and identification can be established by palpation. Once located, the anterior tracheal wall is transfixed by insertion of the L hook. Traction is then applied, anteriorly and



superiorly. Positive identification of the trachea is confirmed by aspirating air with the same syringe and needle used for the local anesthesia. The pointed scalpel is inserted and the incision is extended, laterally and superiorly, on either side to produce a flat U-shaped curve. Less tracheal tearing results from this type of incision, and insertion of the tracheostomy tube is facilitated by simply depressing the small superior flap.

Other technics have been described for rapid tracheostomy, utilizing various types of tracheotomes. Shelden has developed a modified tracheostomy tube for direct percutaneous introduction and has utilized it extensively in adults. The greater simplicity of this technic is valuable in the field and may justify its use in some hospital emergencies. However, because of the following disadvantages of these particular instruments, their use has been abandoned in favor of the method described herein: (1) the lumen of the tracheotome is compromised by a taper at the leading end; aspiration is difficult and cleaning is nearly impossible; (2) there are no instruments small enough for use in children; and (3) serious complications have resulted, according to Witt, from accidental perforations of the posterior tracheal wall, esophagus, or both.

Wider and earlier application of this important simplified technic for tracheostomy, as described in this article, is strongly recommended. Overcoming the restricting concept of tracheostomy as an operating room procedure will promote its use with less delay and with considerable conservation of both money and time.

\* From the Department of Surgery of the University of California Medical Center, San Francisco.

\* \* \* \* \*

### On Cardiac Massage in Children

Editorial from The New England Journal of Medicine 267:516-517,  
September 6, 1962.

"It has been reported by Thaler and Krause elsewhere in this issue of The New England Journal of Medicine that serious trauma to children can result from closed-chest cardiac resuscitation attempts, just as previously found in adults and in the experimental animal laboratory. This is not surprising when one considers the tremendous force that can be exerted when a vigorous adult throws much of his weight suddenly onto the heel of the hand planted over the lower sternum of a limp patient. As in any manual art, one has to 'do it right,' compressing neither so timidly as to be ineffective, nor so heavily as to cause serious injury.

It has been shown that adequate circulation results from properly performed external cardiac compression in adults; this should prevail all the more in children owing to greater flexibility of the sternum and costal cartilages, with correspondingly less force necessary to squeeze the heart effectively between the sternum and spine.



Although, in common usage, cardiac 'massage' is not an ideal term, for it connotes gentle compression of the heart, which is seldom effective. One need only observe a normal heart to see that effective systole is vigorous, rapid, and forceful. If one is to substitute for this in the arrested heart by closed-chest technic, enough pressure must be applied to depress the sternum and forcefully and rapidly compress the heart. It is helpful to imagine that one is attempting to squirt the liquid content of a rubber irrigating syringe across the room; this is not accomplished if one is too gentle, and yet it is not necessary to literally punch the rubber bulb to get adequate output.

In infants and young children, effective pumping of the arrested or nearly arrested heart can be performed by standing to one side of the supine patient, placing one hand beneath the chest and two or three fingers of the other hand upon the lower sternum, then compressing the hands together with a rapid rhythm of 80 to 100 per minute. This bimanual technic with one hand in front and the other hand in back of the small patient permits the operator to better assess the amount of force being applied than can be done in the usual technic used in older patients where both hands of the operator are placed anteriorly against the patient's sternum. Conventional methods of sternal compression are necessary beyond infancy. If closed-chest technic does not produce palpable pulses and seems ineffective, one should not hesitate to open the chest and continue with direct massage.

In the pulseless, apneic patient, there is little point in attempting cardiac resuscitation without simultaneously ventilating the lungs. While one person pumps the precordium, another should artificially respire the patient; this can be done very effectively by direct mouth-to-mouth technic, or by more sophisticated methods if suitable equipment is at hand. Vigorous pulmonary ventilation in itself assists circulation by compressing blood from the lungs into the left side of the heart. If one is alone, there is no choice but, in turn, to compress the heart for a few beats, and then breathe for the patient a few breaths, for it is difficult for one person to do both simultaneously except in the very small patient.

If the acutely arrested heart fails to resume normal action after a few minutes of adequate ventilation and effective manual compression, as judged by the presence of a good peripheral pulse, one should suspect ventricular fibrillation. An electrocardiogram can be obtained with relative leisure, so long as cardiac compression and artificial respiration are continued. If fibrillation is present, electric defibrillation should be attempted, usually possible without opening the chest if the heart is going to respond at all. One or 2 cc of 1 to 10,000 epinephrine solution, or a cubic centimeter or two of 10% calcium gluconate, or both, injected into the heart may help in some cases, but these drugs should not be given at the outset. It is preferable to first employ manual assistance to the arrested heart.

One should not anticipate success from attempting cardiac resuscitation of infants and children in whom the heart has stopped as an end event of some serious disorder, or in the child rushed to the emergency room of a hospital apparently lifeless for some time. On the contrary, frequent success should



attend those cases in which sudden cardiac arrest results from reversible hypoxia, such as during anesthesia induction, some cases of neonatal apnea, and so forth.

There is no doubt that combined artificial ventilation and external manual cardiac compression can, if properly performed, safely and effectively restore selected patients. It would seem wise to incorporate these simple and effective technics into the basic training of all hospital personnel directly concerned with patient care. "

\* \* \* \* \*

### Pediatric Radiology

John W. Hope MD, 1740 Bainbridge St., Philadelphia 46, Penna.  
Editorial, Amer J Roentgenol 88: 589-591, September 1962.

"The concept that infants and children are merely small scale adults with small scale adult diseases was recently refuted when a new radiology resident came to The Children's Hospital of Philadelphia. This doctor was no new boy fresh from internship, but one with several years of training in internal medicine, a tour of duty in the Armed Forces, and almost three years of radiology training in a large Philadelphia medical school hospital. Initially confused by the new surroundings, new technics, different machines, and doubtless by the general noise level which accompanies the study of infants and children, nevertheless he watched attentively as the normal run of disease was going through the department. Near the end of the first week, he finally observed: 'But this is a completely different specialty—even the diseases aren't the same. '

Undoubtedly, part of his reaction was stimulated by being surrounded by very sick children, some with dreadful congenital anomalies, but this is not what he meant. During that week he had found that every examination must be looked at and considered from a different point of view and with a different set of standards than in adult institutions.

For example, even with a simple chest roentgenogram, he fell into the trap of diagnosing a cardiac enlargement without taking into consideration that he was looking at an expiratory roentgenogram. He had to learn that the diaphragm must be down before the apparent large heart becomes significant. Conversely, he did not know the significance of a hyperaerated chest. Week after week in a children's hospital, a baby is referred because of recurrent respiratory infections. These infants often come with several chest examinations in which the diaphragm is down to the tenth or eleventh ribs and the lungs appear clear. By comparative adult standards this would be normal, but in babies these are hyperaerated chests, and perhaps indicative of fibrocystic disease or congenital heart disease. The significance of hyperaeration and hypoaeration can only be learned by seeing as many roentgenograms of babies as a radiologist normally sees of adults.

Probably the most difficult thing to learn in radiology is a concept of normality. Once the normal is established, deviations from the normal are

relatively simple to perceive. Perhaps the right name for a particular deviation will not always be apparent, but at least it will be recognized as a departure from the normal. Since adults have stopped growing, one set of standards is adequate. In growing infants and children, normal standards change month by month and year by year. The writer recalls the first lateral neck roentgenogram of a baby with a suspected foreign body that he was called upon to interpret. The anterior arch of C1 lying out there all alone in the soft tissues, with no connection to the rest of C1, obviously appeared to be a foreign body. The second such case had a long styloid process coming down into the retropharyngeal soft tissues. This too appeared to be a foreign body, because babies should not have long calcified styloid processes. Actually, some do and some do not. Almost every radiologist has called an apparent soft tissue mass in the retropharyngeal space an abscess, when in reality it was nothing more than the normal soft tissues always seen during expiration. On oblique views of the chest, the writer had to learn that the developing sternal bodies are not hilar lymphadenopathy. Normal pulmonary vessels are identical with pneumonia when the film is exposed in expiration. How many of us have called the developing trochlea at about nine years of age a fracture of the elbow? How many radiologists constantly speak of aseptic necrosis of various bones—especially the tarsal navicular and the calcaneal epiphysis—when in reality the irregular epiphysis is a variant of normal? How many of us have talked about an abnormally dilated esophagus or an abnormally large colon in a baby, before we learned that babies grow up to their esophagus and to their colon? The list of errors could be extended to almost every bone and organ in the body, simply because the variations of normal in the growing child are so great.

Adding to the errors in diagnosis is the fact that the diseases themselves are different in children. We all learned that abdominal pain in adults is best studied by examining the gastrointestinal tract with some contrast medium. In the infant and child these studies have a very low yield of positive findings, whereas, intravenous urography is the more informative examination. The tremendously high incidence of congenital anomalies of the genitourinary tract and the even higher incidence of urinary tract infections, especially in the female, make intravenous urography the most productive special study. It is only relatively recently in this country that we have learned that the intravenous urographic study is not completed until we have also visualized the urethra during the act of voiding. Indeed, both the diseases and the methods of study are different.

Many radiologists are unaware of the high incidence of cancer in children. Malignant disease is second only to accidents as the chief cause of death from ages one to fourteen. It is a different type of malignancy, however, than one finds routinely in the adult. Leukemia, in all its protean manifestations, probably heads the list. After this come the sarcomas. Carcinomas of the adult tend to give rise to symptoms early in their development, because they are epithelial tumors which frequently affect the covering or lining layers of a viscus. The sarcomas, being of connective tissue origin, may be silent until extreme growth has occurred or metastasis has taken place. For this reason, all solid



and cystic tumors in childhood must be considered malignant until proven otherwise.

When the writer ceased working with adults, he thought he had put behind him the entire field of functional problems. It did not take long to discover that children are perhaps even more disturbed than adults. Children exhibit their disturbances with a myriad of organic complaints: abdominal pain, chest pain, headaches, chronic constipation, enuresis, vomiting, and others. This is important for the radiologist to know. Frequently children are referred to The Children's Hospital of Philadelphia after having had repeated roentgen examinations of every system in the body. From pediatrician to pediatrician, and therefore from radiologist to radiologist, these children have wandered, solely because of a lack of appreciation of functional disorders. These children have been exposed to much unnecessary radiation. This does not mean that roentgen examinations should not be carried out, but it does behoove the radiologist to perform a proper and definitive study in the first instance, and if his study rules out organic disorders, to suggest that a visit to a child psychiatrist might be of greater value than further roentgen examinations.

Working in a children's hospital, it is deeply disturbing to see the quality of the roentgen examination which often accompanies the referred patient—the pure black or pure white films which defy interpretation, often from hospitals where studies of adults are of the highest quality. Infants and children form the age group which, above all, should be protected against unnecessary radiation. Repeat studies produce unnecessary radiation. Would not it prevent a significant amount of radiation if radiologists paid as much scrupulous attention routinely to "little people" as is paid to adults? A repeat examination of a sixty-five year old adult is infinitely less disturbing than the repetition of a study of a baby because the quality of the original examination left the diagnosis in doubt.

These are random thoughts on the importance of Pediatric Radiology. This sub-specialty has now grown so that it has its own Society numbering about 70 members. This is an encouraging development. It is also encouraging to note that more and more questions pertaining to "little people" are being asked by the American Board of Radiology of their prospective diplomates. After all the stress placed on adult radiology, it is gratifying to observe the growing attention at the other end of the line—on the proper diagnosis for the infant or child who has his whole life before him."

\* \* \* \* \*

Study of the Antibody Response to a Booster of Tetanus Toxoid. "Fifty-Five World War II veterans were studied for their ability to respond to a booster dose of tetanus toxoid. All had received their last booster injection fourteen to eighteen years previously. Tetanus-antibody determinations demonstrated that an excellent response followed the booster injection, with protective levels appearing in one to two weeks in every subject tested."—Sidney Goldsmith MD, et al. New Engl J Med 267:487, September 1962.



## MISCELLANY

### SPECIAL NOTICE

#### Important Nuclear Medicine Training and Service Opportunity

Applications are desired from Medical officers of the rank of LT or LCDR for training and subsequent duty as Medical Officer of the USS BAINBRIDGE DLG (N)25. The BAINBRIDGE is the first of the Navy's nuclear frigates. The training will consist of 12 weeks instruction in nuclear and radiation physics, radiobiology, and radiological health practice at the U. S. Naval Submarine School, Submarine Base, New London, Conn. This training will be followed by 12 weeks on-the-job training in radiological health practices at the Atomic Energy Commission Reactor Site at West Milton, N. Y.

The course of instruction will commence in February or March 1963 and terminate about 1 August 1963. In order to be eligible for this training and duty, it will be necessary to execute an obligated service agreement to serve for a period of two years following completion of the training. Medical officers in the Naval Reserve are eligible to be considered for this assignment provided they are willing to obligate themselves for the necessary service.

Applications should be submitted at an early date and, in any event, not later than 1 November 1962. Further information can be obtained concerning this assignment by writing to the Director, Submarine Medicine Division, Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C.

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#### American Board Certifications

##### American Board of Internal Medicine (Pulmonary Disease)

CDR Donald C. Kent MC USN

##### American Board of Neurological Surgery

LCDR Frederick Enos Jackson MC USN

##### American Board of Obstetrics and Gynecology

LCDR Daniel C. Good MC USN

LCDR Paul A. Hinds MC USN

LCDR Robert F. Kirk MC USN



American Board of Ophthalmology

LCDR Wendell C. Thomas MC USN  
LCDR Frederick C. Wuest MC USN  
LT Firmon E. Hardenbergh MC USNR

American Board of Pathology

LCDR Donnan B. Harding Jr, MC USNR

American Board of Pediatrics

LCDR Fred W. Grello MC USN  
LCDR John R. Kindell MC USN  
LT Morris L. Blue MC USNR  
LT Joel L. Rosenberg MC USNR

American Board of Radiology

LCDR Wallace T. Miller MC USNR  
LT Robert M. Hoffman MC USNR  
LT Stephen E. Puckette Jr, MC USNR  
LT Horace W. Scott MC USNR

American Board of Surgery

CDR Richard L. Davis MC USN  
LCDR Harry G. Light MC USNR  
LCDR Robert W. Youngblood MC USNR  
LT John I. Dickinson MC USNR  
LT David F. Hickok MC USNR

Further Accomplishments by Medical Officers

LCDR Robert F. Kirk MC USN has been elected a Fellow  
of the American College of Obstetricians and Gynecologists.

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Naval Medical Research Reports

U. S. Naval Medical Research Unit No. 3, Cairo, Egypt

1. Morphologic Study of Phlebotomus Papatasi (Scopoli) from Egypt (Diptera: Psychodidae) MR 005.09-1202.5.02, July 1962.

Dental Research Facility, Dental Department, Naval Administrative Command,  
U. S. Naval Training Center, Great Lakes, Ill.

1. Strength, Dimensional Change, and Adaptation of Amalgam Prepared with the 5:5 Ratio MR 005.12-5004.11, April 1962.
2. Relation of Periodontal Health in Naval Recruits to Hygiene, Professional Dental Care, and Education MR 005.12-5004.12, May 1962.

3. Infrared Studies of Human Saliva MR 005.12-5004.8, June 1962.
4. Hemagglutination-Inhibition Activity of Human Parotid Saliva  
MR 005.12-5004.10, June 1962.

U. S. Naval Air Development Center, Aviation Medical Acceleration Laboratory,  
Johnsville, Penna.

1. Perception of Oculogravic Illusions by Inverted Subjects MR 005.13-6002.5  
Report No.2, July 1962.
2. Lever Displacement During Continuous Reinforcement and During a  
"Discrimination" MR 005.13-0002.16 Report No.8, July 1962.
3. Effects of Positive Pressure Breathing on Performance During Acceleration  
MR 005.13-1004.1 Report No.7, July 1962.

U. S. Naval Medical Field Research Laboratory, Marine Barracks, Camp  
Lejeune, N. C.

1. User Test of Portable Turbojet High Speed Dental Handpiece Unit  
MR 005.12-6001.6, July 1962.
2. Transient Deformation in a Non-Metallic Helmet MR 005.12-7010.1.13,  
August 1962.

U. S. Naval Medical Research Laboratory, U. S. Naval Submarine Base, New  
London, Conn.

1. Memorandum Report No. 61-12 Effect of Prolonged Exposure of Animals  
to High Ambient Pressures of Air and of Synthetic Gas Mixtures: an  
Abstract MR 005.14-3100-3.02, December 1961.
2. Syndrome of Decompression Sickness in Historical Perspective  
MR 005.14-3100-2.05, December 1961.
3. Interaction of Aerosols and Air Ions MR 005.14-3300-5.05 Report No.380,  
March 1962.
4. Dental Examination Reliability Memorandum Report No.62-2  
MR 005.12-5220-3.01, April 1962.
5. Improved Method for Intra-Oral Polishing Procedures Memorandum  
Report No.62-3 MR 005.12-5220-3.02, April 1962.

U. S. Naval Hospital, Oakland 14, California

1. (Attn: Clinical Investigation Center) Aminoaciduria in an Elderly Man with  
the Nephrotic Syndrome and in a Young Man with a Variant of the Fanconi  
Syndrome MR 005.12-1103.10, March 1962.
2. (Attn: Navy Prosthetic Research Laboratory) Thigh Pad for Simulated  
Intramuscular Injections MR 005.12 0400, July 1962.

U. S. Naval School of Aviation Medicine, Aviation Medical Center, Pensacola, Fla.

1. Study of CO<sub>2</sub> Build-up with Neck Seal Substituted for Face Seal in Full Pres-  
sure Suit Helmet. MR 005.13-3100 Subtask 8 Report No.11, June 1962.
2. Survival of Animals in Magnetic Fields of 120,000 Gauss MR 005.13-9010  
Subtask 1 Report No.6, July 1962.



DEPARTMENT OF THE NAVY  
Bureau of Medicine and Surgery  
Washington 25, D.C.

BUMED 6710.48  
BUMED-12  
21 August 1962

BUMED INSTRUCTION 6710.48

From: Chief, Bureau of Medicine and Surgery  
To: Naval Hospitals, Naval Dispensaries, Activities having a Station  
Hospital or a Dispensary, and Ships having Medical Personnel

Subj: Poison antidote lockers in emergency treatment rooms

1. Purpose. To promulgate minimum requirements for poison antidote lockers in emergency treatment rooms.
2. Background. During inspections of naval medical facilities, the Inspector General, Medical, has frequently encountered totally inadequate or no poison antidote lockers in emergency treatment rooms.
3. Policy. The Chief, Bureau of Medicine and Surgery, considers a completely equipped antidote locker to be an essential part of every emergency treatment room.
4. Discussion. A separate well-marked poison antidote locker should be located prominently in every emergency treatment room. It should be constructed so the door can be secured with a wire seal. Whenever the seal is broken the contents should be inventoried and used antidotes replaced. In addition, supplies should be routinely inventoried and replaced as necessary. An inventory list for each shelf should be on the inside of the door together with a poison-antidote chart and the address and telephone number of the local poison control centers. As a minimum, the books "Poisoning" by von Oettingen, "Clinical Toxicology of Commercial Products" by Gleason, Gosselin and Hodge and "Handbook of Poisons" by Robert H. Dreisbach, M.D. should be inside the locker where they are always available. The locker should contain sufficient antidotes and supplies to treat the commonly encountered acute poisonings. No supplies or instruments other than those required for treatment of poisonings should be present in this locker. All personnel involved in emergency room treatments should be thoroughly familiar with the contents of the locker.
5. Action. Addresses are directed to comply with the above instruction.

Copy to:  
CINCLANTFLT  
CINCPACFLT  
DMOS&RCMOS  
NATNAVMEDCEN  
NAVAVMEDCEN  
NAVMEADMINU  
NDS&RCS  
SEAFRONS

  
A. S. CHRISMAN  
Deputy and Assistant Chief

Additional copies of this Directive  
may be obtained from:  
Supply Dept., NAVSTA (Wash. NAVYD Annex  
Code 514.25),  
Washington 25, D. C.

From the Note Book

Change in Course Requirement. SECRET security clearance will not be required for persons attending the Air Force Course, Lectures in Aerospace Medicine, as published in the 6 July issue of the Medical News Letter, Vol. 40, No. 1, p. 16.

Malaria in Personnel Returning from Endemic Areas. Judging from previous experience with personnel returning to the United States from malaria endemic areas, it can be expected that a number of returnees from Thailand, South Vietnam, and other malarious areas will sooner or later develop clinical malaria. These persons will be widely distributed among Naval and Marine Corps activities. The onset of malaria in these cases may be delayed for weeks or months, may be atypical in symptoms pattern, and may in some instances be triggered by other disease conditions. The diagnosis of malaria under these circumstances may be unduly delayed or missed altogether unless physicians are aware of the possible presence of latent malaria.

(Preventive Medicine Division, BuMed)

Biomedical Engineering Meetings. The Second Annual San Diego Symposium for Biomedical Engineering was held at the Stardust Motor Hotel in San Diego, Calif., 19 - 21 June 1962, with approximately 325 in attendance. General Chairman of the Symposium was CAPT Philip D. Cronemiller MC USN, Chief of the Medical Service, U. S. Naval Hospital, San Diego. It was sponsored by the American Institute of Electrical Engineers, Committee on Electrical Techniques in Medicine and Biology; the American Institute of Electrical Engineers, San Diego Section; the Institute of Radio Engineers, Professional Group on Biomedical Electronics; Mercy Hospital, San Diego; San Diego Biomedical Research Institute; San Diego State College; Scripps Clinic and Research Foundation, La Jolla; Simulations Councils, Inc.; University of California at San Diego; and the U. S. Naval Hospital, San Diego, Calif.

CAPT Cronemiller will also serve as General Chairman for the Symposium to be held next year, 22 - 26 April, at the Ocean House in San Diego, with approximately 1000 national scientists expected to attend. On 22, 23, and 24 April 1963, the medical aspects will be emphasized. On the 24th, both medical and engineering aspects will be combined. The last two days of the Symposium (25 and 26 April) will consist mainly of engineering aspects.

—USNH San Diego

Biblio-Directory of Cancer Virus Research Workers. The National Cancer Institute, PHS, Dept of HEW, announces the publication of a biblio-directory of current studies, American Scientists in Cancer-Virus Research. The listing of institutional affiliations, research areas, and specific activities of nearly 400 American scientists was compiled by Elizabeth Koenig, Rockefeller Institute, New York City, and Lois Fritz, Children's Hospital of the District of Columbia. Their work was supported by a grant from the National Cancer



Institute to Dr. Dan H. Moore, Rockefeller Institute. Publication of the directory was arranged by staff members of NCI's Virology Research Resources Branch which seeks to facilitate communication among scientists as a part of its program to stimulate worldwide cancer virus research.

The directory, listed as Public Health Service Publication No. 946, may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. The single copy price is 30 cents.

A companion directory, Russian Scientists in Cancer-Virus Research, is planned. A preliminary edition for use of persons attending the Eighth International Cancer Congress in Moscow has been prepared. Individual copies may be obtained free of charge from Virology Research Resources Branch, National Cancer Institute, 7981 Eastern Ave., Silver Spring, Md.

#### American Board of Obstetrics and Gynecology

Office of the Secretary

Robert L. Faulkner M. D.  
2105 Adelbert Road  
Cleveland 6, Ohio

The next scheduled Part I (written) examination of this Board will be held at various examining centers in the United States, Canada and also military centers outside the continental United States, on Friday, December 14, 1962.

Diplomates of this Board are urged to notify the office of the Executive Secretary and Treasurer of a change of address.

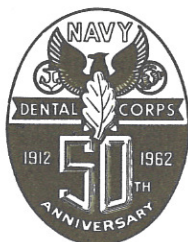
Current Bulletins may be obtained by writing to the Secretary.

—Training Branch, Professional Division, BuMed

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"Lost" Ocean Current Found. Scientists at the Scripps Institution of Oceanography have found an ocean current they thought they had "lost"—the eastern end of the Cromwell Current. This large shallow stream of ocean water, discovered in 1951, courses eastward beneath the equator from the western Pacific to the Galapagos Islands, which sit astride the Equator. But there the great stream—which moves more water than flows in a thousand Mississippi Rivers—simply vanished from the map.

John A. Knauss, Scripps oceanographer who made extensive measurements of the Cromwell Current three years ago, recently returned aboard the research vessel ARGO from an expedition which spent several weeks in the vicinity of the Galapagos Islands. Knauss says that this year's work has proved that the current does not disappear, but veers to the north of the Galapagos and returns to the Equator. However, it does change in nature—weakening in force, shrinking in size, and flowing several hundred feet deeper than it does on the west side of the islands. —NAVNEWS, 1 June 1962

**DENTAL****SECTION**Nutrition, Health and Longevity

Nutrition Foundation, 99 Park Avenue, New York 16, N. Y. Nutr Rev 19:305-306, Oct 1961. Dental Abstracts 7(7):432, July 1962.

Although the average life expectancy of a person born in the United States has lengthened progressively from 40 years a century ago to 73 years today, there is reasonable expectation that science can extend the life span somewhat further. Many persons still die prematurely of degenerative diseases, particularly of the heart and blood vessels.

Unfortunately, most estimates of food requirements are based on experiments which have regarded growth and development as their end. By this means, minimum daily requirements have been established for vitamins, minerals, protein and calories. By a still less logical premise, the theory has been applied that "if a little bit is good, more should be better." Accordingly, the recommended daily allowances for each nutrient are considerably higher. Whether this procedure is wise remains to be learned. Rapid growth rate has been shown to be inversely correlated with survival in rats.

Berg and Simms (1960) found that rats seemed healthier and more vigorous at an advanced age if their caloric intake was restricted moderately. Sprague-Dawley rats were divided into "restricted" and "ad libitum" regimens. Restriction of food was maintained at two levels; rats were permitted to eat either 33% or 46% of the quantities eaten by the ad libitum controls. The results of the first 800 days of this study indicated that restriction of food prolonged the life of both male and female rats, although the females consistently survived longer. Diet restriction also delayed the onset of the four principal degenerative diseases of rats: chronic nephritis, periarteritis, myocardial degeneration, and muscular dystrophy.

The body weight of rats on a restricted diet averaged 40% less than that of the controls. Even at 1,000 days of age, the rats on a restricted diet resembled healthy young rats. Their fur was glossy, their teeth firm, and their activity lively. By contrast, the rats on an unrestricted diet became lethargic and had dull, dirty fur and poor teeth.

Male rats on a restricted diet had a life expectancy of 1,005 days compared with 802 days for males on an unrestricted diet; the comparable figures for female rats were 1,294 and 930 days. Thus, there was a gain of 203 and 364 days of survival for males and females, respectively.

The lower incidence of disease in the rats on a restricted diet was



equally impressive.

The idea that better health can be achieved by somewhat smaller quantities of good food is more attractive than some of the restrictive and unpalatable diets proposed by a few investigators.

\* \* \* \* \*

Relation Between Third Molar  
Agenesis and Missing Teeth of Other Types

Stanley M. Garn and Arthur B. Lewis, Hulman Building, Dayton, Ohio.  
The Relationship Between Third Molar Agenesis and Reduction in Tooth Number. Angle Orthodont 32:1418, January 1962. Dental Abstracts 7(7): 434, July 1962.

To determine whether subjects lacking one or more third molars exhibited a larger proportion of missing teeth of other classes than did subjects with a full complement of third molars, two groups of subjects were investigated clinically and roentgenographically.

The experimental group consisted of 78 private orthodontic patients and 22 subjects from the Fels Longitudinal Series, all of whom lacked one or more third molars. The control group consisted of 398 orthodontic patients, all 14 years of age or older, and all with a full complement of third molars.

Fifty-three teeth of various classes were missing in the 100 children with third molar agenesis, as compared with 17 missing teeth in the 398 control subjects. Corrected for the sizes of the unequal samples, the incidence of missing teeth was 13 times as great in the experimental group as in the control group.

Third molar agenesis is not an isolated dental abnormality. In the experimental group, it was associated with missing central and lateral incisors, cuspids and bicuspid, and first molars. In control subjects unaffected by third molar agenesis, only lateral incisors and first molars were missing in some subjects.

As reported previously by the authors (1961), the absence of third molars also is associated with delayed calcification and movement of the remaining bicuspid and molars.

\* \* \* \* \*

Hazards: Third Molars

A Study of Periodontal Hazards of Third Molars, Major M. Ash, Jr., DDS, MS, Associate Professor, Dept. of Oral Pathology & Periodontia, University of Michigan School of Dentistry, Ann Arbor, Mich. J Periodont 33(3): 218-219, July 1962.

In order to explore the benefit of the early extraction of third molars, 15 early

developing third molars were extracted in patients of 13 to 16 years of age. Little or no root development was present in any of the cases. No periodontal pocket and/or root exposure were present one year after their extraction. Additional cases are being followed at the present time.

Of the original 225 cases 86 have been followed for 2 years, and 38 for 3 years after extraction of third molars. A review of these cases does not indicate any significant change in the pattern of results obtained after one year.

A review of the cases with reformation of the height of the alveolar crest showed that this condition appeared almost exclusively in young patients in which the roots of the third molars were not completely developed.

### Conclusions

Within the limits of the study the following conclusions were made:

1. The presence and/or extraction of completely and partially covered third molars results in a high incidence of periodontal pocket formation on the distal of second molars.
2. Except in young patients, apically placed completely covered third molars should not be extracted simply because they are impacted. After completion of the roots of third molars or after the early twenties in age of patients, the potential for loss of periodontal support of second molars is significantly greater from extraction of impacted third molars than from their retention.
3. The potential for reformation of the normal height of the alveolar crest on the distal of the second molar bears a positive relationship to the terminal period of development of the third molar.
4. All impacted or potentially impacted third molars should be extracted as early in their development as possible to prevent the high incidence of loss of supporting structure on the distal of second molars.

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### Personnel and Professional Notes

Commander Didion Appears at Hawaii Dental Meeting. Cdr Robert W. Didion, DC, USN, Detachment Commander, 1st Detachment, 3rd Dental Company, First Marine Brigade F. M. F. recently presented a table clinic before the Sixtieth Annual Hawaiian State Dental Association Meeting at the Princess Kaiulani Meeting House, Honolulu, Hawaii. The clinic was entitled "Construction of Splints and Temporary Crowns for Crown and Bridge."

Lieutenant Commander Finnegan Makes Presentation. LCdr J. F. Finnegan, DC, USN, U. S. Naval Support Activity, London, recently presented the U. S. Navy Dental Corps film "Endodontics" at the annual convention of the British Dental Association in Nottingham, England.



Newly Standardized Items.

<u>FSN</u>	<u>Nomenclature</u>	<u>Unit Issue</u>	<u>Unit Price</u>
6520-817-2517	Gold Foil, Cylinder, Dental Size 1/64, 2 Pennyweight	Vial	5.62
6520-817-2518	Gold Foil, Cylinder, Dental Size 1/16, 2 Pennyweight	Vial	5.62
6520-817-2519	Gold Foil, Cylinder, Dental Size 1/32, 2 Pennyweight	Vial	5.62

U. S. Navy Dental Corps Continuing Training Program. Recognizing the need for a continuing education program to keep dental officers of the Navy abreast of the latest developments in dentistry and keyed to a high professional level, the U. S. Naval Dental Corps is offering a series of short postgraduate courses conducted by members of the staff of the U. S. Naval Dental School, NNMC, Bethesda, Md.

Among the courses will be Removable Partial Dentures, to be conducted 7-11 January 1963. This course will review the principles and latest concepts in the design of removable partial dentures. Emphasis is to be placed on mouth preparation, impression making, survey and design, recording of maxillomandibular relationships, and patient education. The course consists of lectures, demonstrations, a seminar, and individual participation in limited exercises.

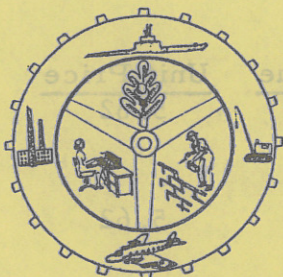
The instructor will be Cdr F. J. Kratochvil, DC, USN, diplomate of the American Board of Prosthodontics. Quotas have been assigned to ComOne, ComThree, ComFour, ComFive, ComSix, ComNine, COMSRNC, and CNATRA.

This short course is open to active duty career dental officers of the Armed Forces in accordance with quotas established by the Bureau of Medicine and Surgery.

Applications should be received in the Bureau as early as possible and preferably, not less than 4 weeks prior to commencement of the course. The Bureau Professional Advisory Board will make recommendations on all requests, and upon approval by the Surgeon General, applicants will be notified as to the final action. Those approved will be nominated for TAD or authorization orders, as appropriate. Accounting data will be forwarded to individual officers nominated for TAD orders. Staff Dental Officers not utilizing assigned quotas should report this information to BUMED, Code 6111, one month prior to the convening date of the course. This will allow the Bureau to fill the quota from other districts.

\* \* \* \* \*





## OCCUPATIONAL MEDICINE

### Navy Civil Service Industrial Hygienists Certified by the American Board of Industrial Hygiene

The following civil service Industrial Hygienists of the Navy have been certified in the "Comprehensive Practice of Industrial Hygiene" by the American Board of Industrial Hygiene (Incorporated 1960):

Daniel J. Bessmer	Puget Sound Naval Shipyard
Roland E. Byrd	USNAS, Jacksonville
Salvatore Di Lestro	USNAS, Quonset Point
Max S. Gabis	Charleston Naval Shipyard
Harry Gilbert	New York Naval Shipyard
Victor H. Kindsvatter	Philadelphia Naval Shipyard
Seymour Levinson	Norfolk Naval Shipyard
Alexander V. Munton	Portsmouth Naval Shipyard
Guido J. Rosati	Mare Island Naval Shipyard
Oscar J. Sobol	USNAS, Alameda
Elizabeth V. Steffee	Pearl Harbor Naval Shipyard
Ernani D. Storlazzi	Boston Naval Shipyard
Herbert J. Worsham	USNAS, Norfolk

To qualify for certification, these Industrial Hygienists were required to be graduates of a college acceptable to the Board (with a baccalaureate degree in chemistry, engineering, or physics); to have at least 15 years full-time practice of industrial hygiene; and to have made recognized contributions to the profession and be working in responsible professional positions.

Five other Navy civil service industrial hygienists (not yet certified), along with the 13 certified ones, operate the industrial hygiene programs of the medical departments of the 18 large industrial naval commands at which full-time industrial hygiene services are provided. These 5 lack the 15 years required for certification without examination, but have the 8 years experience necessary to be eligible to take the written examination.

\* \* \* \* \*



Work Limitations of the Pregnant Employee

William J. Dignam, MD, Los Angeles, California. J Occup Med 4(8), August 1962.

The importance of having some specific suggestions regarding necessary limitations for the pregnant employee is obvious, in view of the large number of women employed in a wide variety of occupations today. These matters are discussed as they apply to the fetus and the maternal organism.

A general rule concerning the developing embryo is that the earlier he experiences a noxious influence the more likely it is to have a serious effect upon him. Therefore, pertinent recommendations would be most helpful if made to female employees before they become pregnant.

The number of agents or experiences known positively to have produced human fetal damage or demise is very small. Among these are maternal infections, hypoxia, radiation, and trauma.

Rubella in the first trimester is the chief offender among maternal infections and has had the most publicity. The epidemic occurrence is most dangerous and it now seems that if epidemic rubella occurs during the first 8 weeks of pregnancy, serious malformations may occur in some 20% of fetuses. The organs most likely to be affected are the eye, heart, ear, and brain. Therefore it is unwise for nonimmune women to continue in occupations where they will be exposed to large numbers of young children.

Fetal hypoxia has been shown in experimental animals to produce congenital malformations. However, the degree of hypoxia produced is more than would ever be encountered in industry. Air travel has not been demonstrated to be harmful to the fetus.

Accidental carbon monoxide poisoning has been responsible for at least one fetal death.

Radiation may have a twofold effect upon the pregnancy. If delivered in sufficient dosage it may damage the infant. It may also have a longer-term effect in the production of mutations. As far as direct effects of radiation are concerned, relatively high doses are necessary to produce obvious damage. For example, if a mother receives full therapeutic doses of radiation for the treatment of pelvic malignancy, microcephaly of the infant may result. Such radiation as received from an atomic bomb has been shown to produce anomalies. With respect to the possible production of mutations, our concepts concerning necessary dosage are not so clearly established. Experimental evidence suggests that mutations can easily be produced in lower forms by radiation, but Kaplan has been unable to demonstrate significant anomalies in the grandchildren of women whose ovaries were irradiated as treatment for infertility.

Trauma has undoubtedly produced some abortions but certainly not many. Emotional upheaval also is much exaggerated as a cause for abortion. Emotional disturbance, either preexisting or as the result of an accident is, in the opinion of most obstetricians, rarely if ever responsible for abortion.



Since the rate of spontaneous abortion is high (10% of all pregnancies) one must be careful in determining etiologic factors. Hertig concluded that the woman claiming that she has sustained a traumatic abortion should bear the burden of proof that the fetus was not abnormal and therefore probably doomed to spontaneous abortion anyway.

Figures submitted by members of the Los Angeles Obstetrical and Gynecological Society, representing a 5 year period and 85,720 deliveries, indicate that among patients who sustained physical trauma, 1131 continued their pregnancies and 57 aborted within 7 days. Of patients who sustained psychic trauma, 914 continued their pregnancies and 85 aborted within 7 days. One physician, who had delivered 750 of these patients, reported that 20 of the group were said to have aborted as a result of physical trauma and 20 aborting after psychic trauma. Another physician, with 1500 deliveries, stated that 30 of the patients had abortions after psychic trauma. This adds a heavy weight of opinion by qualified observers that traumatic abortion is decidedly uncommon.

Comments here concerning pregnant women refer only to normal, healthy ones. Obviously women with complicating illnesses may need to take special precautions.

Pregnant women have tolerated many possibly detrimental experiences without sustaining demonstrable injury. Probably there is a wide margin of safety in the various bodily functions, so that even though they are subjected to undue stresses they will not be decompensated. However, many of the organ systems do function at an increased level of activity during pregnancy and it may be that in many instances this is an obligatory increase in function. Therefore, pregnant women should avoid those circumstances known to put stress on these organ systems.

Suggestions here are based upon changes in physiology which are produced by pregnancy. Some of these are general changes, as in emotional stability. Many pregnant women have very labile emotions, particularly during the first half of pregnancy. Some are easily depressed or reduced to tears by trivial annoyances. Women so affected cannot satisfactorily continue an occupation in which emotional stability is of extreme importance.

Generalized fatigue and exhaustion is a frequent symptom, again noted particularly during the first half of pregnancy. It is almost necessary for such patients to lie down for brief periods during the day. If the occupation demands great concentration and alertness the patient may not perform well during early pregnancy.

Most of these changes disappear by the middle of pregnancy. Many institutions have an arbitrary policy with respect to how long pregnant women may work, but I doubt that these policies are logical from a medical point of view. In general a woman is no less efficient, and perhaps more so in late pregnancy than in early pregnancy. It is desirable for both parties to be able to plan on a time for termination of employment; about 1 month before term is a reasonable time.

Generally speaking, the maternal physiology has reverted completely to normal about 6 weeks after the baby has been delivered; after which time the mother may return to work.



Blood volume and cardiac output rise gradually to a maximum at about the end of the second trimester of pregnancy. Both decline to normal non-pregnant levels by term. Since the cardiac work-load is increased in this manner, it would be best if pregnant women did not further stress the cardiac mechanism by arduous physical labor, particularly around the end of the second trimester.

The venous pressure in the legs rises gradually, to maximum at term, while the venous pressure in other areas such as the arms remains normal. It is felt that this increase is largely mechanical in origin. Pregnant women tend to develop ankle edema easily and pregnancy is certainly the most potent force in the development of varicose veins, so it would be best if pregnant women were not required to continue at occupations where it is not possible for them to interrupt long periods of standing or sitting with periods when their legs can be elevated.

For these same reasons pregnant women frequently have a heavy congested feeling in the lower abdomen and pelvis. This is particularly true of multiparous patients who have relaxation of the supports of the uterus and resultant pelvic varicosities. These symptoms are increased by the Valsalva maneuver, and it is best if pregnant women do not continue in occupations requiring heavy lifting or straining.

Probably because of the amount of blood present in the legs and pelvis during pregnancy, peripheral blood pressure tends to decline, particularly during the middle trimester. At times this decline is rather marked, with resultant syncope, so that pregnant women should not continue at occupations where syncope could be dangerous.

Renal function as measured by glomerular filtration rate and renal plasma flow increases gradually during pregnancy to a maximum at term. It is not yet certain whether this is an obligatory increase, but it may well be. Pregnant women should be especially protected from renal toxins such as mercury.

Changes in the respiratory system include congestion of the mucosa and some elevation of the diaphragm and widening of the thoracic cage. Apparently because of congestion of the mucosa, pregnant women seem to be unusually susceptible to upper respiratory infections. It is unwise for them to work in an atmosphere where irritating dusts are a problem, and certainly they should not work with viruses.

Because of the increase in plasma volume during pregnancy, the hematocrit, hemoglobin, and red cell count will fall unless the bone marrow is able to compensate. Usually it will do this if enough iron is available. Pregnant women should not be exposed to bone-marrow depressants.

Substances which might prove toxic to the organ systems mentioned have been considered previously by governmental regulatory agencies. For example, in 1942 the U. S. Department of Labor suggested standards for maternity care and employment of mothers in industry. It was their recommendation that among the toxic substances considered to be extra hazardous during pregnancy were aniline, benzol and toluol, carbon disulphide, carbon monoxide,

chlorinated hydrocarbons, lead and its compounds, mercury and its compounds, nitrobenzol and other nitro compounds of benzol and its homologs, phosphorus, radioactive substances and x-rays, and turpentine.

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Now There Are Home-Study Courses on  
Radiation Control and Industrial Hygiene

"Hazards Control," Information Exchange Bulletin, University of California, Lawrence Radiation Laboratory, P.O. Box 808, Bldg. 144, Room 188, Livermore, California, Vol. 2, No. 5, May 1962.

The following information regarding home-study courses was received from the Program of Continuation Education of the Columbia University, School of Public Health and Administrative Medicine, 600 West 168th Street, New York 32, New York.

The course on Radiation in Industry is based on the recent book, Radiation: Use and Control in Industrial Application by C. W. Shilling (Grune and Stratton, New York, 1960). The cost of the home-study material is \$10.00. The price of the required textbook is \$6.75. As a service to enrollees the textbook will be purchased and sent along with the home-study material if the amount of \$6.75 plus 25¢ for handling is added to the cost of the home-study material. (Total for both: \$17.00).

The course in Industrial Hygiene is based on a Syllabus for Short Courses for Industrial Hygiene Engineers and Chemists entitled, The Industrial Environment, Its Evaluation and Control, U. S. Public Health Service, Department of Health, Education and Welfare. The cost of this course material \$13.00 (includes home-study material, \$10.00; and syllabus, \$2.75 plus 25¢ for handling).

The text material in the Industrial Toxicology Review consists of 4 sections on: (1) General Principles of Industrial Toxicology; (2) A Guide to the Diagnosis of Occupational Diseases; (3) Economic Poisons; and (4) Laboratory Procedures. The cost of this material is \$20.00. The Biostatistics Course is included with this course without charge.

Review questions have been prepared to assist in grasping the most important points. Persons who purchase the various courses are invited to submit their answers to the study questions to the University for review. Address requests for further information to Leonard J. Goldwater, MD, Professor of Occupational Medicine at the above address.

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Safe Work Procedures  
in Use of Epoxy Aircraft Finishers

H. J. Worsham, Industrial Hygienist, Norfolk Naval Air Station, Norfolk, Va. Quarterly Industrial Health Report, No. 33, April - June 1962.

Epoxy finishers which utilize amine hardeners have been procured for application to aircraft and certain component parts. These materials are notorious producers of dermatitis, which have, as reported in the literature, produced more occupational dermatitis than any other new chemical material within the past 10 years. In addition to producing dermatitis they are sensitizing agents which may require permanent removal of sensitized individuals from the exposure. The amine hardener alone or mixed with the resin component prior to hardening is the principal offender. Precautions must be taken to prevent contact with the skin. In the event of contact, immediate removal is mandatory.

In order to prevent compensable occupational dermatitis the following protective clothing and equipment must be provided prior to commencing the application of subject material:

- a. Coveralls or pants and shirts—minimum of 2 clean changes per week per man with one spare to be used in the event excessive contamination occurs.
- b. Cloth hoods for covering head and neck—2 clean changes per week. Provisions for laundering or replacement must be made.
- c. Suitable gloves.
- d. Protective skin cream
- e. Approved chemical cartridge respirators.
- f. Washing facilities conveniently located in the immediate area if possible or waterless hand cleanser dispenser installed in the immediate area.

The use of protective clothing and equipment and personal hygiene procedures must be rigidly enforced.

\* \* \* \* \*

Hazards to Those Handling Chemicals  
and Wearing Contact Lenses

"Hazards Control," Information Exchange Bulletin, University of California, Lawrence Radiation Laboratory, P.O. Box 808, Bldg. 144, Room 188, Livermore, California, Vol. 2, No. 5, May 1962.

The following information was printed in the Question and Answer section of the Journal of the American Medical Association, Vol. 178, No. 10, Dec. 9, 1961, page 1055. This potential hazard should be brought to the attention of all employees handling chemicals.

Q. An engineer, who wore contact lenses and safety goggles, reported that some caustic blew into his eyes and face. An emergency eye bath flushed the



caustic from his face and partially from his eyes, but the caustic had already caused deep burns which may result in partial loss of sight in one or both eyes. Does the wearing of contact lenses render the cornea unusually susceptible to mechanical or chemical trauma, regardless of the mechanical retaining or excluding action of the contact lens itself? Should the industrial surgeon ban the use of contact lenses among people occupationally exposed to such volatile solvents as paint thinners, turpentine, dust or explosive chemicals? Are there any other hazards for the wearer of contact lenses?

A. Contact lenses, used where there are chemical eye hazards or foreign particles in the air, pose several serious problems. We have no information that the wearing of a contact lens makes the cornea unusually susceptible to mechanical or chemical trauma, but what we do know is that foreign particles and chemicals may be trapped under the contact lens without the patient knowing it and may produce abrasions or chemical damage. Contact lenses should not, therefore, be worn in heavy industry where there are particles in the air or any chemicals, even though regulation safety glasses are also worn. The forbidding of the use of contact lenses is being promoted by heavy industry in particular and sections of small industries that use chemicals or have forge shops. One phase of this problem is the difficulty of detecting the wearer of contact lenses. There is an understandable reluctance of the worker to report that he wears contact lenses.

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### Rethinking in Army After Study of Kuwait Operation

(Effect of Heat on Troops from Britain)

The London Times, London, England, sent by Captain James R. Kingston, MC, USN, Medical Sciences Liaison Officer, Office of Naval Research, Branch Office, London.

"If there had been any fighting in Kuwait at the time of the crisis last summer there would have been heavy casualties from heat exhaustion among British troops, especially those sent direct from the United Kingdom. This is one of the conclusions to emerge from a study of the medical aspects of the operation.

The Army's Operational Research Establishment, which is engaged in a five-year program of research into acclimatization to heat, has set out the main lessons of the Kuwait operation from the medical point of view in a report which is being circulated in the Army.....

A series of meteorological observations taken in the Persian Gulf, as well as the results of interviews with the men who took part in the operation, have been analyzed and collated, together with the medical records of the operation. The most important finding is that, in units which were already in Aden or the Persian Gulf when the operation began, casualties from the



heat were negligible; in those from Cyprus or Kenya the casualty rate from this cause was higher, but still not serious; but in units which moved direct from England as many as 10% were out of action with heat disorders in the first 5 days, although they were not engaged in active operations.

These disturbing figures led the Army to carry out a controlled experiment recently to assess the effect of heat on appetite with special reference to troops moved quickly from England to the Persian Gulf and subjected at once to operational conditions. A platoon of about 30 men of the 1st Parachute Regiment from Aldershot were flown to Aden and put through a 12-day exercise of which 8 days were spent in hard training comparable with active operations, with a 4-day "soft" training period in the middle devoted to rest and games; a similar program was carried out simultaneously by a platoon of the 3rd Parachute Regiment who had been stationed in Bahrein for the previous nine months. The results were dramatic.

Of the troops fully acclimatized none suffered from severe heat illness and only a few became casualties from blisters and other minor complaints. Of the 30-man platoon from England, a quarter were ineffective in a few hours and over a period of 12 days the platoon became for all practical purposes ineffective. This supported the view of medical officers, based on previous acclimatization tests, that more than half of the troops committed to operations in a climate similar to that of Kuwait without a full program of acclimatization lasting at least a week, would become casualties from heat alone without taking account of enemy action.

The recent controlled test and much of the field study on the effects of extremes of temperature on the efficiency of troops in action have been the work of Lieutenant-Colonel J. M. Adam of the Royal Army Medical Corps. Colonel Adam has recently given lectures on his findings and theories at the War Office and to officers of the strategic reserve on Salisbury Plain. To judge from the reactions of some of those who have attended the lectures, some serious rethinking about Kuwait is now going on in the Army.

At a recent meeting held in Southern Command to study the medical support of the Strategic Reserve, Colonel Adam was, according to the "Journal of the Royal Army Medical Corps," again invited to give his views. The aspects of the Kuwait operation, apart from the vital one of acclimatization, which are understood to be causing most concern to those who have had access to the facts are faults of training and equipment. Many soldiers had been inadequately trained in heat discipline, and, in spite of instructions which had been issued on the subject, many officers made the serious mistake of trying to restrict, on mistaken disciplinary grounds, the water supply of their troops in a climate where it is necessary to drink even beyond the demands of thirst. Much of the clothing and personal equipment is said to have been unsuitable in the heat. The rations, although suitable for temperate climates, were unpalatable in the desert, with the result that many troops suffered from heat illness through lack of food.

Much is already being done to put matters right. New equipment and ration packs are being devised, and experiments are contemplated with a system of artificial acclimatization. . . . . Whether this will be successful and whether it will be applicable to the problems of the strategic reserve remain to be proved.



The lessons of the Kuwait operation and of the medical experiments which have been carried out since are of the greatest significance to an important aspect of the Government's defence policy. . . . . When the Minister of Defence made his statement on Kuwait in the Commons a year ago, after the force commander in Kuwait had said that "quite a lot" of his men were suffering from heat exhaustion, he said that only about 1% of the total force each day had been in need of hospital treatment through heat illness. It now appears that this was an average figure, which failed to make clear that many men incapacitated by the heat were treated in their units and in medical establishments other than hospitals, and that the casualty rate was much higher in the early days of the operation. . . . .

Although the Kuwait operation was a model of quick deployment, and although it evidently succeeded in its aim, it has proved one fact beyond dispute—that if a force were required to carry out active operation—actually to fight—in a climate like that of Kuwait, it would be unwise to send units trained on Salisbury Plain. " (without adequate heat acclimatization)

NOTE: Readers are referred to the article "Prevention of Heat Casualties in Marine Corps Recruits" by Capt David Minard, MC, USN in Military Medicine 126:261, April 1961, and the review of this article in the USN Medical News Letter, Vol. 38, No. 4, page 12 of 18 August 1961.

—Editor.

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### Lifting and Carrying

Occupational Health Division, Dept. of National Health and Welfare, Ottawa, Canada. Occupational Health Bulletin 17(4), 1962.

Human muscles aren't yet obsolete in industry. Statistical support of this statement is contained in the Alberta Workmen's Compensation Board Report for 1960 which records 6,663 claims for back injuries due to strain in that year, or 14.3% of all claims. In Montana, 9 out of 10 back injuries reported to the Industrial Accident Board of that State are sprains or strains.

Frequently occupational injuries to the back are of a minor nature; occasionally they result in permanent disability and exact a high price in human suffering and in dollars. In Ontario, in 1959, back injuries averaged \$509.00 for each Workmen's Compensation Board claim. One year later, the cost per claim had risen to \$576.00.

These facts pose certain questions: How and why do such injuries occur? Is man's physical make-up responsible and, if so, in what way?

### Physiological Causes

The Spine. Visualize the complicated structure called the spinal column with its 33 vertebrae, each of which has 7 bony projections to which muscles



and ligaments are attached and which seem to stick out in all directions. The ligaments attach one bone to another, forming joints, and permitting motion between them. Between the joints of the vertebrae are the discs. Coin-shaped and of a hard, gelatinous substance, they act as shock absorbers. If one could see the mass of ligaments, discs and muscles that hold the spine together and make it move, one would be amazed at the intricacy of this truly mechanical marvel. But the structure of the spine is not only complex; it is unstable as well. Designed by nature to function in a horizontal rather than vertical position, the spine gradually developed an upright posture. This development has resulted in a mechanism with the center of gravity balanced rather precariously over a small base and requiring great and constant muscular activity to maintain this position. To this complex mechanism has been added the use of the hands and arms as long levers to grasp objects, but at an unfortunate mechanical disadvantage, as the forces are expended on a localized area of the spine.

Muscles and Ligaments. As stated previously, the ligaments determine the extent of motion in each individual joint. Within these limits, motion is controlled by the muscles that bridge the joint. Each ligament has its maximum strength, elasticity, and contraction power. When forced beyond these limits, it suffers functional and organic injury. When on guard, the muscles protect the ligaments to their utmost ability. Beyond this, the force is exerted on the ligaments. Sudden unexpected application of force may injure the ligament before the muscles are alerted.

### Back Injuries

Thus the complex, delicate mechanism of the spine is a predisposing cause of back injuries. Although herniated and otherwise damaged discs appear on the list of such disabilities, sprains and strains are the most common type of injury.

Sprains and Strains. A muscle may be strained during deliberate effort at too great a task or by sudden increase of load. Its structure gives way with a severe tearing pain which immediately inhibits further effort and induces a protective spasm that immobilizes the part. The individual has difficulty straightening up if stooped, and any motion that adds tension to the injured muscle increases the pain. There is tenderness to pressure on the affected muscle.

A sprain is the tearing or stretching of a ligament. These are tough, somewhat elastic fibrous structures so strong that they sometimes pull off a section of bone rather than give away. Failure to appreciate the pathology of back sprain and strain and the time required for healing of torn ligaments and muscles has resulted in a great waste of man-power and great loss of employee loyalty and plant morale. Employees returned to work too soon are subject to recurrence of disability and permanently diminished back stability. Consequently some industries have designed a programme aimed at preventing back injuries.

### Prevention Programmes

Obviously details of a prevention programme will vary according to the needs of a particular industry, but the National Safety Council has suggested

that when a procedure for the safe handling of materials is being planned, the following 4 points should be emphasized: (1) Selection of employees (2) Training of employees in correct methods of lifting (3) Supervision (4) Use of tools and aids, plant layout.

Selection of Employees. Unfortunately the same care exercised in ensuring that a truck or crane has the capacity to do the job for which it is purchased is not always used in assigning employees to their jobs. Often the manual handling of materials is regarded as a task for unskilled labour, so men are assigned to it because they are unfitted for jobs requiring greater skills. Also, when an extra man is needed to move rush-order material, he will be one who can be spared from another job. He may not have been taught to lift correctly, or he may have defects in his anatomy which cannot stand unusual strain. Pre-employment examinations, conducted carefully by a physician familiar with the plant's needs, will prevent many an employee being assigned to a job beyond his capacity. A man with a predisposition toward hernia, for example, should not be placed on any job involving physical strain.

Nor should men be selected merely on the basis of appearance. Some small, wiry men can handle heavier loads than many taller, heavier men. The burly fellow may have a heart condition, high blood pressure, poor vision or other ailment that might affect his ability to do certain work. Only a medical examination will reveal these defects. Many of these people can be restored to reasonably sound physical condition through medical treatment, although their job assignment should be carefully watched. Details of these physical examinations should remain confidential between doctor and patient. Foremen, however, should be informed of a worker's physical limitations and instructed to avoid assigning him to jobs that might aggravate an existing disability.

An employee's temperament should be considered also. A fast-moving person—one whose physical movements are quicker than his mental processes—may endanger both himself and other members of his team.

Training of Employees. Once employees have been selected, they must be trained because there is a definite knack to lifting and carrying. Seldom is it instinctive; it must be taught. Instruction in these skills might include the following points:

Use Skill, not Force. Lifting depends to a great extent on the skillful use of the right muscles, and not on brute force. The untrained person will usually bend from the waist, using back muscles to lift the load. The experienced man crouches as close to the load as possible with his legs bent at about a 90-degree angle at the knees; his back as straight as possible. In the proper position, leg muscles are in tension, ready to do the work. Back muscles are locked so that the back is held rigid. To lift the object, he straightens his legs, at the same time swinging his back to a vertical position.

Get Help if Load is Too Heavy. When a packing case or similar load has to be manhandled by at least 2 people, the probability of strain will be reduced if the men are of similar height. Six additional pointers are: (1) Grip with the whole palm of the hand. (2) Lift by easy stages, i. e., from floor to knee, from knee to carrying position. (3) Keep the feet 8 to 12 inches apart to ensure balance. (4) Do not twist the body while lifting or carrying. (5) Carry with arms



close to sides and fully extended. (6) Lower the load by bending the legs with back and arms straight.

Avoid Excessive Loads. An excessive load may seriously strain even the trained and experienced worker. If it approaches or exceeds 50% of the individual's body weight, the risk of injury from possible loss of balance is a real one. Opinions vary as to the weight which an individual can safely carry. According to the U. S. Department of Labor, men never should lift more than 50 pounds unaided. Women should lift no more than 25 pounds. The National Safety Council suggests that men should lift not more than 75 pounds or half their own weight, whichever is less. Women should lift no more than 35 pounds or a third of their own weight. Physical differences, however, make it impractical to set up safe lifting limits for all workers.

Examine Lifting Areas. Frequently accidents are caused by the dropping of a load on the feet. It is a good policy to take a look first at the lifting area... clean up slippery or oily parts of the floor and remove anything likely to cause obstruction and subsequent disturbance of natural balance.

Never Jerk, Shove and Twist the Body. These movements abuse and strain arm, shoulder and back muscles and may cause the worker to be incapacitated for many weeks. He should get help whenever necessary and push forward with the arms, steadily and smoothly, back erect.

Stack or Pile No Higher Than Chest. Stacking or piling at too high a level causes fatigue and serious strain. Don't wait until the stack is so high that the load has to be jerked up and forward above head level. Get a pallet platform to stand on or something similarly firm and giving a comparable standing area—an essential for maintaining perfect balance—and stack only chest high.

Keep Hands from Being Injured. Splinters, nails, jagged edges, all are hazards frequently and easily overlooked. When putting down the load, make sure the hands and fingers are free before dropping it; above all, before attempting to carry anything rough or jagged... remember, gloves in use are worth any number in store.

Never Carry Blindly...or Too Much.

Supervision. Training men in correct methods isn't enough. They must be observed on the job to make sure they are following the methods they have been taught.

Equipment and Layout. Even with skilled, careful workers and competent supervision, human failure or job variations may occur. Handling materials offers plenty of chances for these. Frequently the use of special tools and protective clothing will minimize such risks. Handling material is made easier and safer by the use of a wide variety of hand or hand-operated tools, jigs and other devices.

## Conclusion

Far from being obsolete, human arms and backs are extensively used for handling material in this machine age and need the care that a comprehensive preventive programme can provide. Experience has demonstrated the value of such a programme in reducing both the frequency and severity of low back injuries.

## RESERVE



## SECTION

## THE BERRY PLAN

Armed Forces Physicians' Appointment  
and Residency Consideration Program (Part III)

## VI. QUESTIONS AND ANSWERS

(Some of the questions most often asked concerning the operation of this program, and the answers, follow:)

1. Will you change my sponsor to a different service at my request? Only under exceptional circumstances. From 80 to 95% of the participants in preceding programs were given their first choice of service. Failure of the remainder to receive first choice resulted from a disproportionate number of physicians listing one service, in which case it became necessary to refer some to their second or third choice in order to insure an equitable distribution of physicians to the military departments.

2. I did not get my first choice of service. Must I accept this? No. Participation in the program is voluntary. If you do not wish to participate, you may, after 1 March 1963, apply directly to the service of your choice. Acceptance of your application will depend upon the requirements of the particular service at the time you apply. Possibilities may be limited because first preference is given to physicians who apply for the program before 15 September 1962.

3. I have a commission in a branch other than the Medical Corps (Medical Service Corps, Ensign 1915, Artillery, etc.). Am I eligible for this program? Yes, provided you transfer your commission to the Medical Corps of your service. Request for transfer must be submitted to the service in which commission is held, not later than 1 December 1962.

4. I am a member of a reserve component of the Army (Navy or Air Force). May I be allocated to another service? Consideration will be given to a request for allocation to another service only if you have a conditional release from your service. Normally, members of the reserve are allocated to the service with which they are affiliated.

5. Is it possible to withdraw from the program? Yes, you may withdraw from the program at any time prior to accepting a commission. Under these circumstances you would retain your vulnerability to the draft.

6. My school is on the quarter system and I will graduate in September (or December); am I eligible for this program? Physicians who graduate



in September or December of one year will be given the opportunity of participating with students who will graduate the following year. The reason for this is that the mailing list for the program is made up from rosters furnished by the Deans of medical schools in April & May of each year. Names of students who may be graduating in September or December would not be included in the rosters. Thus, the 1962 program is open to physicians whose date of graduation was September 1961, December 1961, March 1962, or June 1962.

7. I have decided I would like to make the service my career (accept a regular commission). Will you change my sponsor? The allocation is not binding if you apply for a regular commission.

8. I desire to accept a commission as a medical officer with the National Guard. Am I eligible for this program? No. However, under the present Department of Defense policy, those accepting a commission as medical officers in the National Guard will not be subject to active-duty orders, except under emergency conditions, provided they fulfill all training requirements specified by the National Guard.

9. I am a participant in the Senior Medical Student Program (or Military Internship Program). Am I eligible to participate in this program? No. Participants in programs which require obligated service upon completion of internship are not eligible for this program.

10. I wish to serve in the U. S. Public Health Service. Am I eligible to participate in this program? No. Individuals who wish to fulfill their obligation by serving with the U. S. Public Health Service should write to the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

11. How does the Commissioned Officer Residency Deferment (CORD) Program of the Public Health Service differ from the Berry Plan? It is essentially the same. Individuals must apply for commission to the Public Health Service by 1 November, for deferment beginning the following 1 July; they must qualify for a Public Health Service reserve commission; reserve commissions in other services are not transferable and therefore must be terminated prior to accepting a reserve commission in the Public Health Service and vice versa. For further information regarding the CORD Program, write to the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

12. I did not apply for the Berry Plan. What is my status at this time? You will be vulnerable for call-up under the Selective Service System in the event that a doctor draft proves to be necessary. A draft call will be placed with the Selective Service System if the services cannot obtain, through voluntary programs such as this one, enough physicians to staff their medical facilities and to provide high standards of medical care to the Armed Forces. Statement of Preference forms may be submitted after 15 September 1962; however, acceptance will depend upon whether vacancies exist at that time. After 1 March 1963 you may apply directly to the military department of your choice to fill an active duty or deferment vacancy that may exist at that time.

13. What rank will I be given if I apply for a commission now? Physicians with less than 3 years professional experience after graduation from medical school may be appointed in the grade of first lieutenant in the Army or



Air Force or lieutenant (junior grade) in the Navy. Under existing Department of Defense policy, medical officers (except interns) are promoted to the temporary grade of captain in the Army or Air Force, or lieutenant in the Navy, effective upon entry to active military service in the Armed Forces.

14. What is the active duty pay and allowance for a captain (medical officer) in the Army or Air Force or lieutenant in the Navy? The pay is \$665.48 with dependents, or \$648.38 without dependents. Medical officers trained in aviation medicine or submarine medicine may receive extra pay while serving in an assignment involving flying or duty aboard submarines.

15. If I accept a commission in the Armed Forces will I be subject to a draft call by Selective Service? No. Draft calls are filled by Selective Service registrants classified I-A. It is the announced policy of Selective Service to classify registrants who are members of the reserve components of the Armed Forces I-D.

(To be continued)

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